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ABSTRACT

The relationship between curriculum design and improvement in student ability to reason critically was studied, using data gathered in an evaluation of a citizen leadership institute for high school students. While the literature on teaching thinking emphasizes direct instruction both to introduce reasoning skill to students and to promote its transfer across domains and settings, it is theorized that this emphasis on instructional design may be misleading. The one-month residential citizen leadership school held in the summer of 1986 is described, and changes in participants' reasoning concerning public policy were studied. A pre-test/post-test design was used with a random sample of 24 of the 98 participants. Theoretical propositions are presented that associate the observed changes in reasoning with the school's curriculum design. The observed improvement in critical thinking found in this study appears to be a by-product of curriculum design and is attributed to the additive effect of two curriculum design features: a multiple-case approach; and problem finding. An appendix lists six categories deduced from the conception of dialectical thinking. Thirty-seven references are listed. (SLD)

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CRITICAL THINKING AND CURRICULUM DESIGN IN THE CIVIC DOMAIN

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Abstract

This paper theorizes on the relationship between curriculum design and improvement in student ability to reason critically. The theory was suggested by data gathered in an evaluation of a citizen leadership institute for high school students. While the literature on teaching thinking emphasizes direct instruction both to introduce reasoning skill to students and to promote its transfer across domains and settings, the theory presented here suggests that this emphasis on instructional design may be misleading. First, the institute is sketched and data on participants' reasoning are presented and analyzed. Then theoretical propositions are presented that associate the observed changes in reasoning with the institute's curriculum design.

CRITICAL THINKING AND CURRICULUM DESIGN IN THE CIVIC DOMAIN

The present surge of interest in critical thinking is not merely a rehashing of prior concerns. Important developments are occurring, and chief among them is an increased understanding of the ways critical thinking is indebted to the domains and tasks in which it occurs. Of particular interest to social studies educators is critical thinking in the civic, or public policy, domain. This paper considers a type of critical thinking, dialectical reasoning, and reports on a one-month civic leadership institute that may have improved its participants' dialectical reasoning on public policy issues. An analysis of the institute's curriculum points to two design features that may account for this improvement. They are a multiple case study approach and an overarching problem-finding task. It is theorized that the improvement of critical thinking in school settings may be as much a consequence of curriculum design as instructional design.

The Institute

This institute was a one-month, residential, "citizen leadership" school held in a city on the West Coast during the summer of 1986.

The stated goals of the institute were

> . . . to teach young people to critically value the American democratic experiment; to provide a balanced introduction to four public policy arenas (local, state, nation, world); to provide practical training to enhance interpersonal effectiveness and group leadership skills; to develop and advance an innovative

model of civic education by integrating cognitive and affective learning styles through experiential education and mentoring; and to restore the fun of learning.

Participants were students between the eleventh and twelfth grades. Their selection was by teachers, counselors, and administrators because they were thought to have leadership potential, scholastic ability, and an interest in community service. Applications were screened by a panel of eight community leaders, and 98 students were selected according to stated criteria: caring about civic life, initiative, and ability to communicate clearly in writing. The panel also obtained minority representation at a level greater than state proportions and a state-wide demographic distribution.

The institute's curriculum centered on two major "themes"--civic education and leadership training. Secondary themes were arts and physical education. The civic education theme included the concepts community, values, sustainable future, politics, individual rights and community obligations, competing policies, democratic capitalism, humanities, religious and ethical values, and the role of technology in social change. The faculty sought to develop these in the context of four public policy arenas, each of which was given a week's attention: the local community in the first week, the state in the second, the nation in the third, and the world community in the fourth. The leadership training theme included a related set of concepts: practical community skills, self-assessment, self-reflection, virtue, ethics, vision and the courage to act, reading the environment, and civic entrepreneurism. There was in each week of the four

weeks a special leadership training question: What is reality? What do I need to know? How do I communicate ideas? Where are we going?

During the month, students were assigned to groups of nine, each with one adult "mentor." The groups met four times each week for 90 minutes to discuss and engage in journal writing on the week's concerns. These groups were intended to function as support groups in which feelings and problems could be aired and discussed.

Each week had a fifty-hour, planned curriculum. The types of activities (with percentage estimates) were lecture, panel, or film presentations on such topics as public accountability, the Soviet perspective on the United States, social contract theory, and cultures of the region (13%); open dialogue with speakers (6%); large- and small-group directed discussions(25%); small group facilitated discussions (13%); leadership skills practice--for example, giving a presentation, leading a meeting, and negotiating (7%); dramatic and expressive arts activities (14%); field trips (7%); reading and journal writing (9%); orientation to daily and weekly activities (6%).

Two design characteristics of the curriculum were a loose case-study approach and individual project planning. Students were involved in presentations, discussions, debates, and writing on exemplars (cases) of local, state, national, and world issues. In each case, students were exposed to a range of positions and points of view. On the second day of the institute, for example, a film and panel of elected local officials

introduced students to the idea sustainable future and to diverse views of what that might mean for the students' communities. That afternoon, students discussed these views in small groups and later that evening held a debate. By calling this a loose case-study approach, we wish to distinguish it from a more explicit and systematic case-study approach where curriculum developers, faculty, and students know that the curriculum was indeed developed around cases, students are asked often to compare and contrast cases, and cases are selected and sequenced to maximize within and across-case learning (see Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, in press).

Individual project planning also characterized the curriculum. Participants knew from the outset that they would be asked at the end of the month to outline a community service project, which they would plan and conduct during their senior years. This planning task more-or-less pervaded the month's activities, formally as blocks of time were set aside for project planning and informally as participants mulled the issues alone and with peers and faculty.

Dialectical Reasoning on the Civic Landscape

Although critical thinking is again a popular idea with educators, it remains an elusive concept. Several questions are central to the current discussion and will serve as a background to our treatment of dialectical reasoning.

First, does the skills model fit critical thinking? That is, is critical thinking best considered as a set of discrete operations or as something else--something broader and deeper like dispositions (Ennis, 1987), situation modeling (Johnson-Laird, 1983; Perkins, 1986), or cognitive flexibility (Spiro et al., in press)? Second, is critical thinking generic, is it domain- and taskbound, or is it some combination of these (e.g., Perkins, 1985; Simon, 1980; Sternberg & Wagner, 1986)? Third, can critical thinking be taught, and, if so, how, when, where, and by whom (e.g., Baron & Sternberg, 1987; Parker, 1987; Perkins, 1985, 1987; Segal, Chipman, & Glaser, 1985)? Fourth, what is critical thinking (e.g., Beyer, 1985a; Ennis, 1987; McPeck, 1981; Paul, 1987; Sternberg, 1985)?

Our response to the first of these questions is that, generally speaking, critical thinking does not fit the skills model. Adapted to that model (the essence of which is the familiar cycle of instruction, followed by guided practice, followed by independent practice), critical thinking is quickly fragmented and trivialized. The critical in critical thinking is lost, and its character washed out. To the second, for reasons that will be clarified below, our response is that critical thinking is generally domain and task specific. This is to say it is generally bound by the contexts in which it occurs. To the third, can critical thinking be taught?, our answer is a qualified yes. It is qualified because intelligence is more than thinking (it also includes insight and neurophysiological capacity, or "power"), and because the more modifiable aspects of thinking are very likely limited at any moment by one's developmental

gestalt (e.g., Piaget, 1954; Kohlberg, Levine, & Hewer 1984) and the discouragement of one's immediate milieu (e.g., Parker, 1986; Vygotsky, 1978).

These responses hint at our reponse to the fourth question, What is critical thinking? Critical thinking is reasoned judgment that presses beyond skillful cognitive performance to genuine and flexible exploration of the issue or problem at hand. Moreover, this exploration occurs not only abstractly and generally but in contexts--in particular settings with particular content (domain) and action (task) requirements. The use of the term exploration is appropriate when one considers civic issues and problems as richly textured problem spaces, or landscapes (Spiro et al., in press; Wittgenstein, 1953).

Now, a particular sort of critical thinking is appropriate to genuine exploration of a civic or public policy landscape. This is a complex, messy domain where information, algorithms, and relevant generalizations are often lacking (i.e., its problems are ill-structured [Simon, 1973]), and where diverse values and points of view can lead reasoners to very different conclusions even when they use the same information and rely on the same algorithms and generalizations (i.e., its problems are multi-logical [Paul, 1987]). Critical thinking on such issues involves not merely the proper application of facts, concepts, and generalizations to the problems at hand (such neatness is a luxury of better-structured domains). Nor does it involve merely the skills of defending one's opinion, which is a luxury of monological domains, such as solving word

problems in math. Rather, critical thinking on such issues involves the broader constructive and dialectical activity of assembling a model of the terrain being reasoned about and, fundamental to this model building, interrogating one's position on the issue and the point of view that frames it.

Model building involves considerably more than skillful thinking because, especially in the domain of civic issues, skillful thinking typically is dedicated to making right a position that was taken early. Such activity is not to be confused with a search for truth--a distinction to which Socrates devoted his life. Defensive thinking should be distinguished from the intentionally open, exploratory activity of dialectical thought on civic issues (Parker, Mueller & Wendling, 1987; Paul, 1987; Perkins, Allen, & Hafner, 1983).

Method

At the request of its director, an evaluation of the institute was conducted to measure changes in particpants' reasoning on public policy issues. A pretest-posttest design was used with a random sample of 24 of the 98 participants. Compared were pairs of four-paragraph essays written by the sample--one on the first day of the institute and one on the last. Student reasoning in categories where a significant difference was found was then analyzed against curriculum design features of the institute. Finally, in the grounded research tradition (Glaser & Strauss, 1967),

hypotheses were generated on the relationship of particular design features to improvements in student reasoning.

Data

At each writing, students selected from given issues one on which to write the essay. Issues included: Should publishers of school books use language that includes both sexes, like person and people, and avoid man or men when appropriate?, and Should citizens be allowed to voice their opinions even if they disagree with the government?

At each writing students were instructed to write a four-paragraph essay about an issue. They were told that each paragraph was to have a particular purpose: In paragraph one, they were to summarize what they knew about the issue; in paragraph two, to state their position on the issue and give the reasons for the position; in paragraph three, to argue against their position, giving counterarguments to those in paragraph two; and in paragraph four, to write a conclusion.

As evinced in these task requirements, a key measurement decision in the study was to elicit dialectial reasoning as a requirement of the writing task and then measure changes in its quality. This was done instead of eliciting an unguided response and then measuring any increase in dialectical reasoning. This technique, a form of scaffolding (Greenfield, 1984; Vygotsky, 1978), or metacognitive guidance, encourages reasoners to perform better than they otherwise might without guidance; consequently, it

provided an opportunity to study these students' reasoning at its best, so to speak, both before and after the institute.

Two levels of scaffolding were present: at the essay and paragraph levels. At the essay level, writers were guided explicitly to set the second and third paragraphs against one another dialectically. Within paragraphs, however, scaffolding varied: Students were not helped with either the knowledge summary (paragraph one) or the conclusion (paragraph four). In the second paragraph (the "myside argument"), students were guided to present both a position on the issue and reasons (plural) for that position. More explicit scaffolding in this paragraph might have told students to "state your position and then support it with two or three different, good reasons." Similarly, in the third paragraph (the "otherside argument"), students were guided only so far as to argue against the position stated in the previous paragraph. More explicit scaffolding might have told students to "argue against each of the two or three reasons you gave for your position in the last paragraph. Be sure to think carefully about these counterarguments and present them convincingly, as one who believed them might."

Analysis

Varying the scaffolding in this way permitted an analysis of the ways students filled in the unscaffolded gaps. Five questions were investigated: First, at the essay level, did more students compose the

dialectical essay as instructed at the end of the institute than at the beginning? Second, turning to individual paragraphs, did more students at the end of the institute provide the summary requested in paragraph one? Third, did more students at the end of the institute compose a reasonably complex supporting argument for their position in the second paragraph? Fourth, regarding the third paragraph, and again comparing the pre-essay to the post-essay, three questions consider the cogency of the otherside argument: (a) Did the third paragraph connect meaningfully to the second such that it provided a counterargument(s) to the argument given in the second, or was it largely a non sequitur? (b) Was the counterargument at least somewhat empathic? That is, did the writer endeavor to represent coherently and fairly the counterargument, perhaps even capturing its logic? (c) Was it at least as complex as the myside argument given in the prior paragraph? Fifth, did the fourth paragraph (the conclusion) contain more dialectical reasoning in the post- than in the pre-essay? That is, did the writers compose a conclusion that merely re-argued the logic of the second paragraph's myside argument, or did it contain a broader logic--something of a synthesis of the opposing logics, or one that at least mentioned the counterarguments?

Six categories (see Appendix) were deduced from the conception of dialectical reasoning outlined earlier, and a content analysis (Holsti, 1969) was carried out on both sets of essays.[1] Pretest and posttest means on interval variables (categories A, B, and E) were compared using correlated t-tests. Proportions on nominal variables (categories C, D, and

F) were compared using McNemar's test for the difference between two correlated proportions.

The next procedure was hypothesis generation. Student reasoning on categories where a significant difference was found was analyzed against the institute's curriculum, and hypotheses were formulated on the relationship of particular design features to the improvements in student reasoning. This theorizing is presented below under findings (Glaser & Strauss, 1967). First, however, results of the content analysis are given.

Findings

Content Analysis

Table 1 displays the results of the content analysis. First, The number of dialectical essays increased by one, from 22 to 23 (of 24). The two students (#10 and #17, Table 1) who did not argue against their position in the pre-essay did so in the post-essay. However, one who did so in the pre-essay did not in the post-essay (#12), instead continuing to argue for his or her position even in paragraph three.

Table 1
Content Analysis: Pre/Post Categories*

Subject	A	B	C	D	E	F
1	2/0	3/1	no/no	yes/yes	1/3	no/yes
2	2/0	1/2	no/yes	yes/yes	1/3	no/no
3	0/0	1/3	no/yes	yes/yes	1/3	no/yes
4	0/2	1/4	no/yes	yes/yes	2/3	yes/yes
5	1/0	1/2	no/no	yes/yes	1/1	no/no
6	0/0	1/5	no/no	yes/yes	1/4	no/no
7	2/0	2/2	no/yes	no/yes	3/2	no/yes
8	0/1	1/1	no/no	yes/no	1/1	yes/no
9	0/0	1/3	no/yes	yes/yes	2/2	yes/yes
10	1/1	1/3	no/no	no/no	0/1	no/no
11	0/0	2/2	no/no	yes/yes	2/3	yes/no
12	0/0	1/2	no/no	yes/no	1/0	yes/no
13	0/4	1/2	yes/yes	yes/yes	2/3	no/yes
14	0/1	2/2	no/yes	yes/yes	2/3	no/yes
15	4/1	2/3	no/no	yes/yes	2/2	yes/yes
16	1/1	1/2	yes/no	yes/yes	1/2	no/no
17	1/1	2/3	no/no	no/yes	0/1	no/no
18	0/1	1/1	yes/yes	yes/yes	1/2	no/no
19	0/0	1/2	no/yes	yes/yes	1/2	yes/yes
20	1/1	1/1	no/yes	yes/yes	1/2	yes/no
21	1/0	1/3	no/no	yes/yes	1/1	no/yes
22	0/0	3/3	no/no	yes/yes	1/1	yes/yes
23	2/0	2/3	no/no	yes/yes	1/2	yes/no
24	0/1	4/1	yes/yes	yes/yes	2/1	yes/no

*A = number of value claims in first paragraph; B = number of reasons in myside paragraph; C = relevant counterargument; D = empathic count erargument; E = number of reasons in counterargument; F = dialectical conclusion.

Second, there were three fewer value claims in paragraph one in the post-essays than in the pre-essays, meaning that there were three fewer instances of using the first paragraph as a preliminary myside argument.

Third, there were 19 more lines of supportive reasoning in the second paragraph in the post-essays than in the pre-essays. Students as a group were arguing for their positions with a greater number of myside arguments, which was regarded as an indicator of increased complexity.

Fourth, regarding the otherside argument (third paragraph), there are three findings: (a) The number of otherside paragraphs that were related meaningfully to the myside arguments (i.e., that countered the particular supporting reasons given in the second paragraph) increased from four (17%) to ten (42%); (b) The number of otherside paragraphs that were written empathically did not change (21, or 87%, were empathic in each set of essays); (c) There were 17 more lines of otherside reasoning in the post-essays than in the pre-essays. The students were arguing against their positions with a greater diversity of counterarguments, which is regarded here as an indicator of increased complexity. That students were arguing with a greater number of lines of reasoning both for and against their position was regarded as an indicator of increased flexibility.

Fifth, the number of conclusions (fourth paragraph) that contained dialectical reasoning did not change (11, or 46%, of the fourth paragraphs were dialectical in each set of essays).

Two of these differences were statistically significant ($p < .05$): The essays written at the end of the institute contained significantly more

lines of reasoning in both the myside and otherside arguments. These were variables B and E on Table 1 and pertained to questions #3 and #4C above.

Hypotheses

Accounting for this improvement is no simple task. Little is known about critical reasoning in the civic domain, let alone the mechanisms by which it might develop, and our description of what actually occurred during the institute is not as rich as it might be. Moreover, weaknesses inherent in any pretest-posttest design require skepticism on the claim that student reasoning changed during the institute. Consequently, the assertions in this section should be treated as hypotheses to guide future inquiry.[2]

The significant differences on number of reasons given in the myside and otherside paragraphs are especially interesting when it is recalled that 92% of our writers were already reasoning dialectically on the pre-essay. This improvement in the number of lines of reasoning generated on both sides of the issue was, then, an increase not in kind, but quality. The construct affected--complexity in dialectical reasoning--appears to be central to model building in ill-structured, multilogical domains.

The four public policy issues presented to students in the pre- and post essays were by nature controversial and fuzzy. These issues crisscross multiple categories, cases, values, and logics; they are entangled in all manner of ancillary problems and bodies of knowledge with

which our writers may have had great or little familiarity and to which many or no connections may have been perceived. Consequently, reasoners' production of multiple lines of reasoning both for and against their position allows the construction of a model that at least approaches the character of the terrain at hand. This marks an intellectual achievement of no small dimension, particularly considering the natural tendency toward defensive thinking, or egocentricity and confirmation bias (Kahneman, Slovic, & Tversky, 1982; Kohlberg, Levine, & Hewer, 1984; Paul, 1987).

However, we must conclude that much of this progress was made before the institute began, since 92% of the writers were able to argue, with guidance, both for and against their position in the pre-essay. What occurred during the institute, we hypothesize, was a sort of metacognitive fine-tuning in the direction of greater complexity and flexibility. We are suggesting that metacognitive, or self-regulatory, processes (Brown et al., 1985) are amenable to evolution as are other kinds of knowledge (see Rumelhart & Norman, 1978), and we imply this because while the level of external guidance remained constant from the pre- to the post task, the performance improved.

We attribute the observed improvement in dialectical reasoning to the additive effect of two curriculum design features: a multiple-case approach and problem finding. For four weeks, students were exposed to multiple case knowledge and to presentation and discussion forums in which similarities and differences, patterns and connections, among cases were explored. This kind of experience provided the sort of opportunity that we

believe may increase complexity in dialectical reasoning. It was an opportunity for what we call crisscrossing in the search mode.

The institute was for its participants a sort of civic immersion event. Unlike school settings where the day's learning is fragmented into apparently unrelated tasks and domains, the institute bombarded participants six days a week for four weeks with a spectrum of data and learning activities that were focused on civic problems. The multiple levels of problems (local, state, national, global), combined with the large and small group discussions and reflective writing, we suggest, provided students with an opportunity to reason not just within but across cases and across competing logics on cases.

This crisscrossing may build complexity and flexibility in reasoning in three key ways. First, individual cases are broken down or decomposed into issues, problems, events, actors, logics, and other properties (Sacerdoti, 1977). Second, numerous combinations become possible across cases among those properties. Because each connection represents just one permutation of properties, understandings can be assembled in many ways from just a few cases (see Spiro et al., in press). Third, and here is the additive effect, students knew they would be required at the end of the institute to propose a civic project they would conduct the following year. This requirement placed the multiple case design in a broad task environment of problem finding which, in turn, produced a frame effect. That is, the task of identifying and planning a one-year civic project to be conducted during the students' senior year became a frame of reference that shaped

the way students made sense of the multiple cases. Specifically, it caused students to sense-make, or construct understandings, in a search mode. Operating in this mode promoted throughout the month the crisscrossing, decomposition, and recombining just described. While much work on problem finding has concentrated on differences between experts and novices (e.g., Getzels & Csikszentmihalyi, 1976; Sternberg, 1987), of interest here is a different problem-finding question: How does the problem-finding intent function metacognitively to increase scrutiny of multiple cases by both experts and novices, thus aiding both decomposition within cases as well as across-case searching?

The impact of crisscrossing in the search mode on complexity and flexibility in dialectical thought can be appreciated when it is contrasted with its absence--what could be called knowledge telling on a single case. Bereiter and Scardamalia (1985) propose that knowledge telling is a cognitive coping strategy used frequently by students in response to task requirements that permit it. The strategy enables them to respond to composition instructions by circumventing the different processes of searching back and forth across many knowledge stores and assembling several for the problem at hand. Instead, the strategy has them tell what they know about the topic demarcated by topic cues in the question. This telling, a sort of file dumping, while perhaps sufficient for essay questions requiring simple recall of data (e.g., What were the three causes of the Civil War discussed in the text? How did Hemingway use metaphor?), is worthless for tasks requiring explanation, inference, comparison,

analysis, relevant otherside reasoning, and other sets of processes requiring goal-oriented crisscrossing. The institute curriculum, to our knowledge, never put before students tasks requiring simple knowledge telling; rather the tasks to which they were exposed, and in which they were evidently engaged a good deal of the time, required the sort of searching, connecting, and pattern making for which mere dumping would be fruitless.

To summarize, we have theorized that the institute promoted a good deal of crisscrossing and reflection on civic case knowledge in a problem-finding task environment, and that this experience may account in part for the observed increase in the number of lines of reasoning for and against the writers' position. By implication, we are hypothesizing that dialectical reasoning can be improved without direct instruction when the curriculum includes tasks requiring crisscrossing in the search mode. While not overturning it, this proposition raises doubt about the popular claim that skill in critical thinking will not obtain as a byproduct of study in a given domain and must, therefore, be taught directly (e.g., Beyer, 1985b; Glaser, 1985). The apparent improvement in critical thinking found in the present research appears indeed to be a byproduct of curriculum design.

Discussion

Much work is still needed to refine this theorizing and to draw implications for curriculum practice, and that work will need to address at

least two key questions: First, how might curriculum be designed so that students learn to reason dialectically on civic problems and then do so even without the sort of guidance provided in the task studied here? Answering this will require an application to the civic domain of existing theory on strategy instruction and internalization (e.g., Brown et al., 1985; Pressley, Snyder, & Cariglia-Bull, 1987; Vygotsky, 1978). But first, educators will need to decide whether dialectical reasoning is worth the trouble. Other valuable thinking/learning strategies vie for curriculum space (reading comprehension and concept formation strategies, to name two), and the development of any of these will require systematic attention over many years. In our view, dialectical reasoning is worth the time and effort and should be one of the handful of strategies that receives sustained attention in the curriculum. The previous discussion of dialectical reasoning should provide a brief rationale, and one is elaborated elsewhere (Basseches, 1984; Parker, 1986; Paul, 1987).

Second, how might crisscrossing in the search mode be appropriate in school settings, which typically are not residential, concentrated, or designed pedagogically for the study of multiple cases, crisscrossing, and problem finding? While there is at present no mature theory on multiple-case curriculum design, inroads have been made. For example, Spiro et al. (in press) discuss case selection and sequencing procedures that invite crisscrossing and optimize pattern seeking and pattern making. Their concern is the effect of the way knowledge is represented in memory on its subsequent availability for use in ill-structured domains. This is,

of course, a problem of knowledge transfer: "How should knowledge be acquired and organized to facilitate a wide range of future applications?" (p. 1). The key factors affecting this transfer, they contend, are the flexibility with which learners have represented knowledge in their memories, combined with the metacognitive control they have over those flexible representations. While the former accomplishes a knowledge storage system that facilitates future use in ill-structured situations, the latter enables the learner to actually do the necessary combining and model building when those situations arrive.

They suggest two "middle ways" for good case selection and sequencing. First, cases selected for study should have an intermediate degree of well-structuredness. Second, they should be intermediately related to one another; that is, they should partially overlap. As for the first, cases selected should not be so neatly constructed that they invite the error of treating an ill-structured problem area as if it were well structured, resulting in a knowledge representation that is inflexible and will resist the decomposition and rearrangement necessary for modeling building in new situations. Neither should they be so ill-structured that students stand little chance of making the desired connections. As for the second, cases should be selected for study that comprise a balance between similar and dissimilar features: some aspects of a case should overlap another case. Yet the overlapping aspects should vary as subsequent cases are examined.

Conclusion

This theorizing, albeit nascent, takes seriously the awesome transfer problem in an ill-structured domain like public affairs, and it seeks ways to develop curriculum accordingly.[3] The present concern for "teaching thinking" may provide a window of opportunity for conceiving education as a genuine search for understanding, and for conceiving that search as a constructive, model-building activity that helps one reason through present and future problems. This would be a welcome shift, for rarely in reasoning on public problems is one aided by neatly packaged prior knowledge that just happens to fit the new situation at hand. Rather, an exploration must be undertaken--prior knowledge must be decomposed, assembled, and reassembled, and other logics explored. The development and study of curriculum designs that require such work would be, in our judgment, worthy.

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NOTES

1. It should be evident from these categories (see Appendix) that better dialectical reasoning, in the context of the given task, was considered to possess six attributes: First, the first paragraph was a background summary of the issue and contained, relatively speaking, none of the author's opinions on the matter (i.e., it was not a preliminary myside argument). Second, the second paragraph expressed the author's position and more than one line of supporting reasoning. Third, the third paragraph argued against the position expressed in the previous paragraph, using more than one line of counter reasoning. Fourth, the counterarguments in the third paragraph were related to the reasons given in the second. Fifth, these counterarguments were presented empathically--that is, without apparent intent to garner myside support for the author's position. Finally, the concluding paragraph was dialectical within itself: It did not merely give the author's position and support, but at least acknowledged the existence of counter reasoning.

2. Another important reason why these assertions are hypotheses rather than generalizations is that this study was not a true experiment. Our writers were clearly not a random sample of 11th-12th grade students, and there was no control group. While these conditions most definitely prevent generalization, they permit the very sort of theorizing needed to decide which experiments are needed (Glaser & Strauss, 1967; Popper, 1972).

3. In addition to elaborating and exemplifying these two guidelines, theorizing on the multiple case approach will need to address the additive

effect hypothesized in this study--that problem-finding encourages across-case searching, and that without it there is little reason to expect that learners will be motivated to undertake the intellectual labor on which the multiple case approach relies.

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Appendix
Six Categories Deduced from the Conception of Dialectical Thinking

CATEGORY A: VALUE CLAIM. A value claim is a statement in paragraph one expressing the author's belief about what is important, good, right or worthwhile concerning the issue--about an end state worth or not worth attaining. In contrast to knowledge claims, which state what the author considers to be true (factual) about the issue, and which can be more-or-less verified empirically, a value claim expresses a judgment (i.e., opinion) that cannot, as a judgment, be verified. An example of a statement not classified as a value claim is, "Citizens in communist countries do not have the opportunity to voice their thoughts and ideas." The author is stating this as a matter of fact. An example of a statement classified as a value claim is, "The people of the United States are fortunate that they can demonstrate and voice their individual opinions."

CATEGORY B: LINES OF SUPPORT. A line of support is a reason given in paragraph two to justify the author's position on the issue. For example, a subject argued for free speech using two lines of support. The first drew upon the concept, popular sovereignty: "Government is made up of citizens." The second asserted that dissent is valuable because, "Disagreement can bring new, innovative ideas into society and can cause a society to do soul searching."

CATEGORY C: RELEVANT COUNTERARGUMENT. This category is concerned with the presence or absence of a semantic connection between the otherside

argument in paragraph three and the myside argument in paragraph two. What first had to be established was whether the third paragraph argument was counter to the position taken in paragraph two. If it was, the next determination was whether this counterargumentation was relevant to the particular line(s) of support given in paragraph two. For example, a line of support in paragraph two referred to ". . . the benefits of freedom of speech in generating new ideas for improving our system of government." The third-paragraph counterargument pointed to ". . . the problems that new ideas, which arise out of free speech, cause for our government." This counterargument was classified as relevant.

CATEGORY D: EMPATHIC COUNTERARGUMENT. The concern in this category is with the author's attempt to step into the shoes of those who might argue otherwise and to understand those counterarguments from within. The otherside reasoning in paragraph three was judged empathic if it was presented convincingly and without apparent myside bias. A good test for empathy was to read paragraph three before reading the author's first two paragraphs. An empathic third paragraph did not give the author's position and reasons and, if read alone, could be mistaken for the author's myside argument. In contrast, a non-empathic third paragraph was used as another forum in which to continue the myside argument; and, even though a counter-argument might be mentioned, its treatment served the myside argument.

CATEGORY E: LINES OF COUNTERARGUMENT. A line of counterargument has the properties of a line of support, except that it counters rather than supports the author's position. The concern here was to determine how many

different reasons the author generated that served to argue against his or her myside argument.

CATEGORY F: DIALECTICAL CONCLUSION. A fourth paragraph was judged dialectical if the writer acknowledged the existence of a counterargument(s) or, beyond this, pointed to some aspect of the counterargument(s) that was worth considering or, going still further, pitted against one another the myside and otherside arguments.

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